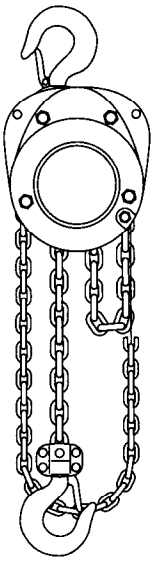
PARTS, OPERATION AND MAINTENANCE MANUAL
for
MANUAL CHAIN HOIST MODELS

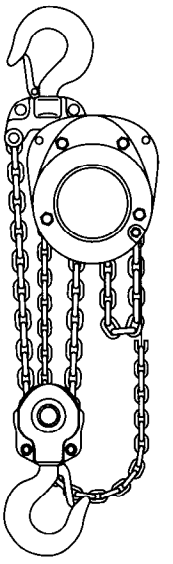
ME4-005 1/2 ton
ME4-010 1 ton
ME4-015 1-1/2 ton
ME4-020 2 ton
ME4-030 3 ton
ME4-050 5 ton

Including **S•COR•E** (Spark and Corrosion Resistant) Features
Unless otherwise noted, tons in this manual are metric tons (2,200 lbs.)



(Dwg. MHTPA0066)

1/2, 1 and 1-1/2 ton



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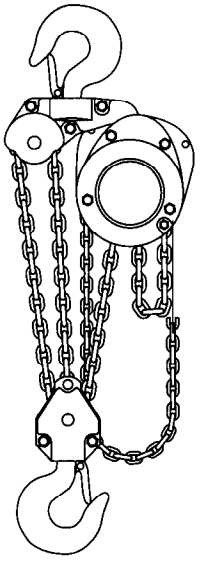
2 and 3 ton



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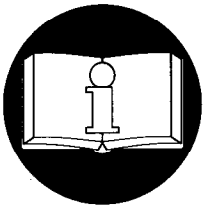
5 ton



READ THIS MANUAL BEFORE USING THESE PRODUCTS. This manual contains important safety, installation, operation and maintenance information. Make this manual available to all persons responsible for the operation, installation and maintenance of these products.

⚠WARNING

Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this hoist in accordance with American National Standards Institute Safety Code (ASME B30.16) and any other applicable safety codes and regulations.

Refer all communications to the nearest Ingersoll-Rand Material Handling Products Office or Distributor.

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INGERSOLL-RAND®
MATERIAL HANDLING

This manual provides important information for all personnel involved with the safe installation, operation and proper maintenance of this product. Even if you feel you are familiar with this or similar equipment, you should read and understand this manual before operating the product.

Danger, Warning, Caution and Notice

Throughout this manual there are steps and procedures which, if not followed, may result in a injury. The following signal words are used to identify the level of potential hazard.

⚠ DANGER Danger is used to indicate the presence of a hazard which ***will*** cause ***severe*** injury, death, or substantial property damage if the warning is ignored.

⚠ WARNING Warning is used to indicate the presence of a hazard which ***can*** cause ***severe*** injury, death, or substantial property damage if the warning is ignored.

⚠ CAUTION Caution is used to indicate the presence of a hazard which ***will*** or ***can*** cause ***minor*** injury or property damage if the warning is ignored.

NOTICE Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.

Safety Summary

⚠ WARNING

• Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

• Hoists are designed to provide a 4 to 1 safety factor. The supporting structures and load-attaching devices used in conjunction with this hoist must provide adequate support to handle all hoist operations plus the weight of the hoist and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.

The National Safety Council, Accident Prevention Manual for Industrial Operations, Eighth Edition and other recognized safety sources make a common point: Employees who work near cranes or assist in hooking on or arranging a load should be instructed to keep out from under the load. From a safety standpoint, one factor is paramount: conduct all lifting operations in such a manner that if there were an equipment failure, no personnel would be injured. This means keep out from under a raised load and keep out of the line of force of any load.

Ingersoll-Rand Material Handling hoists are manufactured in accordance with the latest ASME B30.16 standards.

The Occupational Safety and Health Act of 1970, generally places the burden of compliance with the owner/employer, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are, rather, connected with the final installation. It is the owner's responsibility and user's responsibility to determine the suitability of a product for any particular use. It is recommended that all applicable industry, trade association, federal, state and local regulations be checked. Read all operating instructions and warnings before operation.

Rigging: It is the responsibility of the operator to exercise caution, use common sense and be familiar with proper rigging techniques. See ASME B30.9 for rigging information, American National Standards Institute, 1430 Broadway, New York, NY 10018.

NOTICE

• Using other than genuine Ingersoll-Rand Material Handling parts may void the warranty.

SAFE OPERATING INSTRUCTIONS

The following warnings and operating instructions have been adapted in part from American National (Safety) Standard ASME B30.16 (Overhead Hoists) and are intended to avoid unsafe operating practices which might lead to injury or property damage.
These recommendations apply to hoists used for material handling of freely suspended unguided loads.

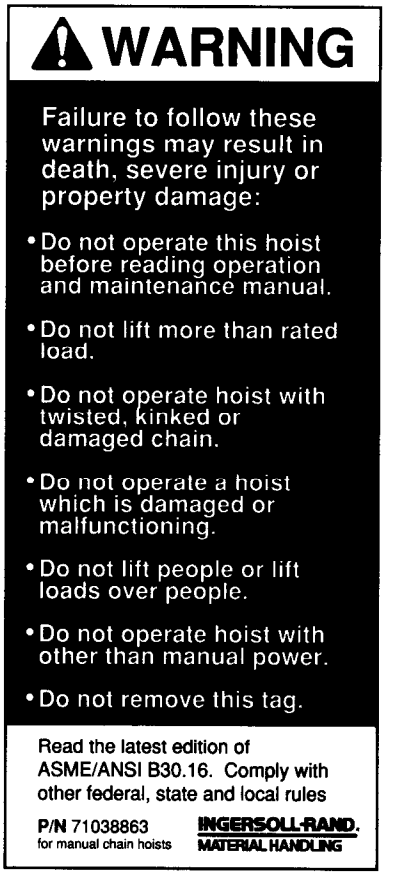
Ingersoll-Rand recognizes that most companies who use hoists have a safety program in force in their plants. In the event you are aware that some conflict exists between a rule set forth in this publication and a similar rule already set by an individual company, the more stringent of the two should take precedence.

Safe Operating Instructions are provided to make an operator aware of dangerous practices to avoid and are not necessarily limited to the following list. Refer to specific sections in the manual for additional safety information.

1. Only allow people, trained in safety and operation of this product, to operate the hoist.
2. Only operate a hoist if you are physically fit to do so.
3. When a "DO NOT OPERATE" sign is attached to the hoist, do not operate the hoist until the sign has been removed by designated personnel.
4. Before each shift, the operator should inspect the hoist for wear or damage.
5. Never use a hoist which inspection indicates is worn or damaged.
6. Periodically, inspect the hoist thoroughly and replace worn or damaged parts.
7. Lubricate the hoist regularly.
8. Do not use hoist if hook latch on a hook has been sprung or broken.
9. Check that the hook latches are engaged before using.
10. Never splice a hoist chain by inserting a bolt between links.
11. Only lift loads less than or equal to the rated capacity of the hoist. See warning tags attached to the hoist.
12. When using two hoists to suspend one load, select two hoists each having a rated capacity equal to or more than the load. This provides adequate safety in the event of a sudden load shift.
13. Never place your hand inside the throat area of a hook.
14. Never use the hoist load chain as a sling.
15. Never operate a hoist when the load is not centered under the hook. Do not "side pull" or "yard."
16. Never operate a hoist with twisted, kinked, "capsized" or damaged load chain.
17. Do not force a chain or hook into place by hammering.
18. Never insert the point of the hook into a chain link.
19. Be certain the load is properly seated in the saddle of the hook and the hook latch is engaged.
20. Do not support the load on the tip of the hook.
21. Never run the load chain over a sharp edge. Use a sheave.
22. Pay attention to the load at all times when operating the hoist.
23. Always ensure that you, and all other people, are clear of the path of the load. Do not lift a load over people.
24. Never use the hoist for lifting or lowering people, and never allow anyone to stand on a suspended load.
25. Ease the slack out of the chain and sling when starting a lift. Do not jerk the load.
26. Do not swing a suspended load.
27. Never leave a suspended load unattended.
28. Never weld or cut on a load suspended by the hoist.
29. Never use the hoist chains as welding electrodes.
30. Do not operate hoist if chain jumping, excessive noise, jamming, overloading, or binding occurs.
31. Only operate the hoist with manual power.
32. After use, properly secure hoist and all loads.

WARNING TAG

Each hoist is supplied from the factory with the warning tag shown. If the tag is not attached to your unit, order a new tag and install it. See the parts list for the part number. Read and obey all warnings and other safety information attached to this hoist. Tag may not be shown actual size.


WARNING
Failure to follow these warnings may result in death, severe injury or property damage:
• Do not operate this hoist before reading operation and maintenance manual.
• Do not lift more than rated load.
• Do not operate hoist with twisted, kinked or damaged chain.
• Do not operate a hoist which is damaged or malfunctioning.
• Do not lift people or lift loads over people.
• Do not operate hoist with other than manual power.
• Do not remove this tag.
Read the latest edition of ASME/ANSI B30.16. Comply with other federal, state and local rules
P/N 71038863
for manual chain hoists
INGERSOLL-RAND
MATERIAL HANDLING

SPECIFICATIONS

Model Code Explanation

Model Code Example **ME4 - 050 - 10 - 8**

Series **ME4**

Hoist Capacity

005 = 1/2 metric ton (500 kg/1,100 lbs)
010 = 1 metric ton (1,000 kg/2,200 lbs)
015 = 1-1/2 metric ton (1,500 kg/3,300 lbs)
020 = 2 metric ton (2,000 kg/4,400 lbs)
030 = 3 metric ton (3,000 kg/6,600 lbs)
050 = 5 metric ton (5,000 kg/11,000 lbs)

Lift (Hoist load chain/hook travel)

10 = 10 feet (3 metres) standard
15 = 15 feet (4.5 metres)
20 = 20 feet (6 metres)
XX = Specify length
F = Hoist without chain

Hand Chain Drop (Hand chain is 2 ft. (0.6 m) less than lift)

8 = Lift 10 ft. chain drop 8 ft. (standard)
13 = Lift 15 ft. chain drop 13 ft.
18 = Lift 20 ft. chain drop 18 ft.
XX = Specify length

Table 1

Model No.	Rated Capacity metric tons*	Pull to lift rated load		Chain size (mm)	Chain O'Hauled to lift load 1 ft (0.3 m)		No. of chain falls	Net Weight (std. 10 ft. lift)	
		lb	kg		ft	m		lb	kg
ME4-005	1/2	66	30.0	5.0	19	5.8	1	22	10.0
ME4-010	1	79	35.8	6.3	31	9.4	1	29	13.2
ME4-015	1-1/2	92	41.7	7.1	41	12.5	1	40	18.1
ME4-020	2	88	40.0	6.3	63	19.2	2	48.5	22.0
ME4-030	3	101	45.8	7.1	81	24.7	2	64	29.0
ME4-050	5	101	45.8	7.1	134	40.8	3	84	38.1

* One metric ton equals 2200 lbs.

INSTALLATION

Prior to installing the hoist, carefully inspect it for possible shipping damage.
Hoists are supplied fully lubricated from the factory. Lubrication of the load chain is recommended before initial hoist operation.

⚠ CAUTION

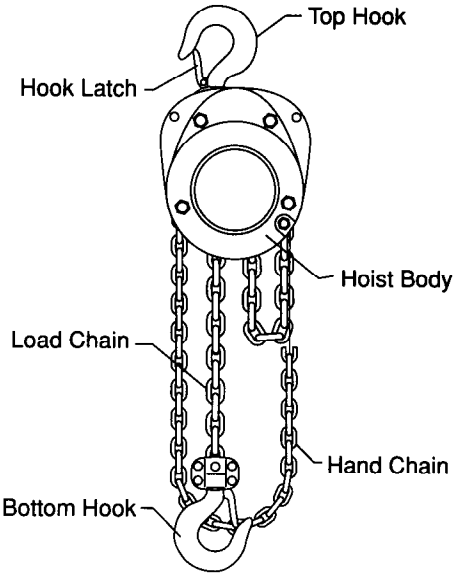
• Owners and users are advised to examine specific, local or other regulations, including American National Standards Institute and/or OSHA Regulations which may apply to a particular type of use of this product before installing or putting hoist to use.

⚠ WARNING

• A falling load can cause injury or death. Before installing, read "SAFETY INFORMATION".

Hoists are designed to provide a 4 to 1 safety factor. The supporting structures and load-attaching devices used in conjunction with this hoist must provide adequate support to handle all hoist operations plus the weight of the hoist and attached equipment. This is the customer's responsibility. If in doubt, consult a registered structural engineer.

The ME4 manual chain hoist must be used in a vertical position to provide a straight line pull from the top hook to the bottom hook. The hoist must be positioned so that it does not contact the support members when in use. When operating in limited areas suitable lifting attachments or slings must be used to prevent the hoist body and hand chain from being obstructed.



(Dwg. MHTPA0490)

Initial Operating Checks
Run in the hoist with a test load (10% of rated capacity) by raising and lowering this load several times. Verify the load brake operation with this light load prior to applying heavier loads.

NOTICE

• Each time a load is lifted, the operation of the load brake should be checked by raising the load slightly and stopping to ensure the brake will hold the load before proceeding to lift the load.

Familiarize operators and people responsible for hoist installation and service with ASME B30.16 specifications prior to placing the unit into service. All the requirements of this specification, including testing should be met before approving the hoist for operation.

OPERATION

The four most important aspects of hoist operation are:

1. Follow all safety instructions when operating the hoist.
2. Allow only people trained in safety and the operation of this hoist to operate the hoist.
3. Subject each hoist to a regular inspection and maintenance procedure.
4. Be aware of the hoist capacity and weight of load at all times.

⚠WARNING

• Only allow personnel trained in safety and operation of this hoist to operate the hoist.
• The hoist is not designed or suitable for lifting, lowering or moving persons. Never lift loads over people.

Hoist Operation

When facing the hand chain side of the hoist:

Rotate hand chain clockwise to raise load.
Rotate hand chain counterclockwise to lower load.

NOTICE

• The clicking sound of the pawl on the ratchet gear is normal when a load is being raised.

Storing the Hoist

1. Always store the hoist in a no load condition.
2. Wipe off all dirt and water.
3. Oil the chain, hook pins and hook latch pins.
4. Hang in a dry place.
5. Before returning hoist to service follow instructions for Hoists not in Regular Service in the "INSPECTION" section.

INSPECTION

⚠WARNING

• All new, altered or modified equipment should be inspected and tested by personnel trained in safety, operation and maintenance of this equipment to ensure equipment in service.

Careful inspection on a regular basis will reveal potentially dangerous conditions while still in the early stages, allowing corrective action to be taken before the condition becomes dangerous.

Frequent and periodic inspections should be performed on equipment in regular service. Frequent inspections are visual examinations performed by operators or personnel trained in safety and operation of this equipment and include observations made during routine equipment operation. Periodic inspections are thorough inspections conducted by personnel trained in the safety, operation and maintenance of this equipment. ASME B30.16 states inspection intervals depend upon the nature of the critical components of the equipment and the severity of usage. Frequent and periodic inspection intervals for equipment use under various operating conditions are listed below:

1. Frequent Inspection:

NORMAL	HEAVY	SEVERE
monthly	weekly	daily

2. Periodic Inspection:

NORMAL	HEAVY	SEVERE
yearly	semi-annually	quarterly

in safety, operation and maintenance of this equipment. A determination as to whether a condition constitutes a safety hazard must be decided, and the correction of noted safety hazards accomplished and documented by written report before placing the equipment in service.

Records and Reports

Inspection records, listing all points requiring periodic inspection should be maintained for all load bearing equipment. Written reports, based on severity of service, should be made on the condition of critical parts as a method of documenting **periodic** inspections. These reports should be dated, signed by the person who performed the inspection, and kept on file where they are readily available for review.

NOTICE

• The external placement of coded marks on equipment identifying completed inspections and operationally certified equipment is an acceptable method of documenting periodic inspections in place of written records.

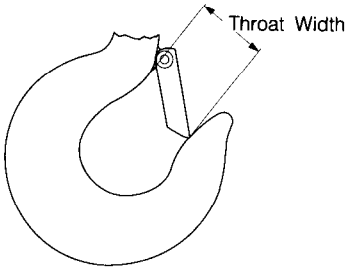
Load Chain Reports

Records should be maintained documenting the condition of load chain removed from service as part of a long-range load chain inspection program. Accurate records will establish a relationship between visual observations noted during frequent inspections and the actual condition of the load chain as determined by periodic inspection methods.

Frequent Inspection

On equipment in continuous service, frequent inspection should be made by operators at the beginning of each shift. In addition, visual inspections should be conducted during regular operation for damage or evidence of malfunction.

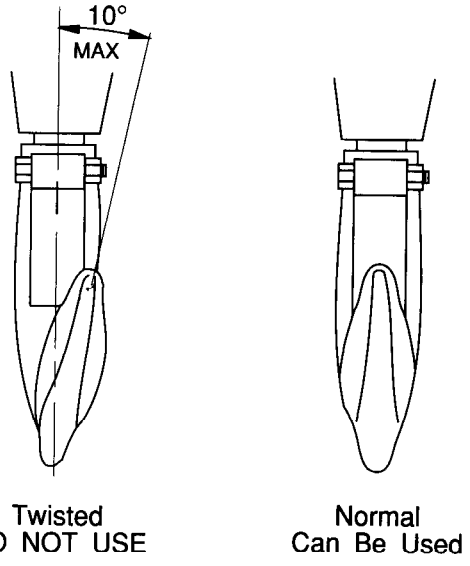
1. OPERATION. Operate the hoist by raising a load approximately 6 inches (150 mm) off the ground. While lifting and lowering load, check for visual signs or abnormal noises which could indicate damage. Check for smooth operation; binding or any malfunctions are not acceptable. Do not operate the hoist unless the chain feeds through the hoist and hook block smoothly. Listen for "clicking". The clicking sound of the pawl on the ratchet gear is normal when a load is being raised. If load chain binds, jumps, or is excessively noisy, clean and lubricate the chain. If problem persists, replace the load chain. Hand chain should move freely; without binding or excessive drag. Hook should stop moving when hand chain stops moving.
2. HOOKS. Check for wear or damage, increased throat width, bent shank or twisting of hook. Replace hooks which exceed the throad opening discard width (15%) shown in Table 2 (ref. Dwg. MHTPA0040) or that exceed a 10° twist (ref. Dwg. MHTPA0111). If the hook latch snaps past the tip of the hook, the hook is sprung and must be replaced. Check hook support bearings for lubrication and damage. Make sure that they swivel easily and smoothly. Repair or lubricate as necessary.



(Dwg. MHTPA0040)

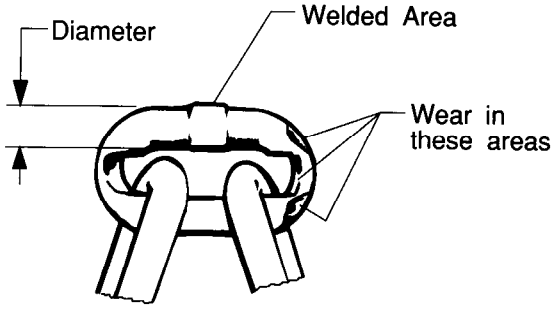
Table 2

Model No.	Throat Width		Discard Width	
	in.	mm	in.	mm
ME4-005	1.22	31	1.40	35.6
ME4-010	1.34	34	1.54	39.1
ME4-015	1.48	37.5	1.70	43.2
ME4-020	1.57	40	1.81	45.9
ME4-030	1.81	46	2.08	52.8
ME4-050	1.97	50	2.27	57.6



(Dwg. MHTPA0111)

3. HOOK LATCH. Check operation of the hook latch. Replace if broken or missing.
4. CHAIN. (Ref. Dwg. MHTPA0102) Examine each of the links for bending, cracks in weld areas or shoulders, transverse nicks and gouges, weld splatter, corrosion pits, striation (minute parallel lines) and chain wear, including the load bearing surfaces between chain links. Replace the entire chain if any part fails inspection. Check lubrication of load chain and lubricate if necessary. See "Load Chain" in the "LUBRICATION" section.



(Dwg. MHTPA0102)

NOTICE

• The full extent of chain wear cannot be determined by visual inspection. At any indication of chain wear inspect chain and load sheave in accordance with instructions in "Periodic Inspection.

5. LOAD CHAIN REEVING. Make sure chain is installed correctly and the welds on standing links are away from load sheave (ref. Dwg. MHTPA0042). Re-install chain if necessary. Make sure chain is not capsized, twisted or kinked. Adjust as required. See "MAINTENANCE" section for load chain reeving detailed information.

Periodic Inspection

NOTICE

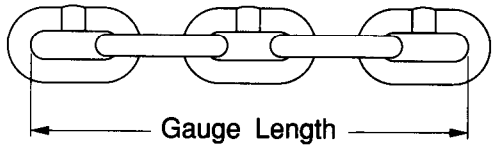
• Refer to "INSPECTION AND MAINTENANCE REPORT" for guidance on documenting periodic inspection items.

Disassembly may be required as a result of initial indications of inspections or in order to properly inspect the individual components. Disassembly steps are described in the "MAINTENANCE" section. Maintain written records of periodic inspections to provide an accumulative basis for continuing evaluation. Inspect all items listed in "Frequent Inspection." Also inspect the following:

1. FASTENERS. Check retainer rings, split pins, capscrews, nuts, and other fasteners on hooks, hoist body and trolley (as applicable). Replace if missing or damaged and tighten if loose.
2. ALL COMPONENTS. Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates potential damage, disassemble as required to conduct a detailed inspection. Inspect gears, shafts, bearings, sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
3. HOOKS. Inspect hooks for cracks. Use magnetic particle or dye penetrant methods to check for cracks. Inspect hook retaining parts. Tighten, repair or replace, if necessary. Refer to ASME B30.10 (HOOKS) for additional hook inspection information.
4. CHAIN SHEAVES. Check for damage or excessive wear. Replace damaged parts.
5. BRAKES. Ensure proper operation. Brake should not slip with test load (10% of capacity). If initial inspection indicates the need, disassemble. Brake discs must be free of excess oil or grease, must appear unglazed, must be uniform in thickness and be at least 3/32 inch (2.5 mm) thick. Check all other brake surfaces for wear, deformation or foreign deposits. Check pawl brake. Teeth of ratchet gear should be undamaged, and should stop gear rotation in the counterclockwise direction. Check pawl spring for damage. Clean and replace components as necessary.
6. TAIL PIN. (End Anchor) Ensure end tail pin on chain hoist is engaged and unbent. Replace if damaged or missing. Refer to "Attaching End of Load Chain" in the "MAINTENANCE" section to remove, install or replace.
7. LOAD CHAIN. Inspect chain for stretching by measuring across five link sections throughout the length of the chain (ref. Dwg. MHTPA0041). If any five lengths in the working length reaches or exceeds the discard length, replace the entire chain. Discard lengths are shown in Table 3 . Always use a genuine **Ingersoll-Rand Material Handling** replacement chain.

Table 3

Model No.	Part No.	Chain Size	Normal Length		Discard Length	
		mm	in.	mm	in.	mm
ME4-005	LCCF005	5.0	2.97	75.5	3.06	77.7
ME4-010	LCCF010	6.3	3.76	95.5	3.87	98.3
ME4-015	LCCF015	7.1	4.17	106.0	4.30	109.1
ME4-020	LCCV010	6.3	3.76	95.5	3.87	98.3
ME4-030	LCCF015	7.1	4.17	106.0	4.30	109.1
ME4-050	LCCF015	7.1	4.17	1060	4.30	109.1



(Dwg. MHTPA0041)

8. SUPPORTING STRUCTURE. Check for distortion, wear and continued ability to support load.
9. LABELS. Check for presence and legibility of labels. Replace if damaged or missing.

Equipment Not in Regular Use

1. Equipment which has been idle for a period of one month or more, but less than one year, shall be given an inspection conforming to the requirements of "Frequent Inspection" before being placed in service for general use.
2. Equipment which has been idle for a period of over one year shall be given a complete inspection conforming with the requirements of "Periodic Inspection" before being place in service for general use.
3. Standby equipment shall be inspected at least semi-annually in accordance with the requirements of "Frequent Inspection". In abnormal operating conditions equipment should be inspected at shorter intervals.

INSPECTION AND MAINTENANCE REPORT

ME4 Model Hoists

Model Number:	**Date:**
Serial Number:	**Inspected by:**

Reason for Inspection: (Check Applicable Box)

- ☐ 1. Scheduled Periodic Inspeciton (___ Monthly ___ Quarterly ___ Yearly).
- ☐ 2. Descrepancy(s) noted during Frequent Inspection.
- ☐ 3. Descrepancy(s) noted during maintenance.
- ☐ 4. Other: _____.

Refer to the Parts, Operation and Maintenance Manual "INSPECTION" section for general inspection criteria. Refer to applicable component and unit American National Standards Institute Safety Codes for specific technical requirements. If in doubt about an existing condition contact the nearest INGERSOLL-RAND Distributor or the factory for technical assistance.

COMPONENT	CONDITION		CORRECTIVE ACTION		NOTES
	Pass	Fail	Repair	Replace	
Fasteners					
Gears					
Shafts					
Bearings			---		
Load Bearing Sheaves					
Chain Guides					
Springs			---		
Covers					
Hooks:					
Top — Actual Hook Throat Width: _____ inches / _____ mm (reference Table 2 for maximum acceptable width).					
Top — Hook Twist			---		(maximum 10%)
Top — Hook Crack Test Method Used: _____ Dye Penetrant _____ Magnetic Particle _____ Other: _____					
Bottom — Actual Hook Throat Width: _____ inches / _____ mm (reference Table 2 for maximum acceptable width).					
Bottom — Hook Twist			---		(maximum 10%)
Bottom — Hook Crack Test Method Used: _____ Dye Penetrant _____ Magnetic Particle _____ Other: _____					
Hook Latch			---		
Brakes (10% Load Test)			---		
Brakes (Visual Inspection)					
Tail Pin (End Anchor)					
Load Chain			---		
Working length(s) maximum stretch: _____ inches / _____ mm (reference Table 3 for maximum acceptable stretching).					
Supporting Structure					
Labels and Tags			---		
Other Components (list in NOTES section)					

Testing:	**Pass**	**Fail**	
Operational (No Load)			
Operational (10% Load)			
Operational (Maximum Test Load *)			

* Refer to the Parts, Operation and Maintenance manual "Testing" in the "MAINTENANCE" section to determine Maximum Test Load.

LUBRICATION

General

Thread lubricant or an anti-seize compound use is recommended for threaded shafts, capscrews and nuts. Unless otherwise stated, remove old lubricant, clean the part with an acid free solvent and apply a new coating of lubricant to the part before assembly.

Gears (19)

Unscrew U-nuts (23), on the opposite side of the hoist as the hand chain, and remove body (11). Remove old grease and replace with new. See "Accessing Load Gear (19)" in "MAINTENANCE" section. For temperatures -20° to 50° F (-29° to 10° C) use EP 1 grease or equivalent. For temperatures 30° to 120° F (-1° to 49° C) use EP 2 grease or equivalent.

Load Chain

⚠WARNING

• Failure to maintain clean and well lubricated load chain may result in chain failure causing injury, death or substantial property damage.

1. Lubricate load chain weekly, or more frequently, depending on severity of service.
2. In a corrosive environment, lubricate more frequently than normal.
3. Lubricate each link of the chain and apply new lubricant over existing layer.
4. Lubricate hook and hook latch pivot points.
5. Clean chain with acid free solvent to remove rust or abrasive dust build-up and lubricate the chain.
6. Use **Ingersoll-Rand** Lubri-Link® or a SAE 50 to 90 EP oil.

TROUBLESHOOTING

This section provides basic troubleshooting information. Determination of specific causes to problems are best identified by thorough inspections performed by personnel trained in safety, operation and maintenance of this equipment. The chart below provides a brief guide to common hoist problems, probable causes and solutions.

PROBLEM	CAUSE	SOLUTION
Hoist will not hold rated load.	Brake may be slipping.	Inspect and repair as described in the "INSPECTION" and "MAINTENANCE" sections.
Hoist will not lift load.	Hoist is overloaded.	Reduce load to within rated capacity.
Load Chain Binds.	Damaged load chain, pinion shaft, gears or sheaves.	Disassemble and inspect components as described in the "MAINTENANCE" and "INSPECTION" sections.
	Load chain not installed properly (twisted, kinked or "capsized").	Inspect and repair as described in the "INSPECTION" and "MAINTENANCE" sections.
Hand Chain Binds.	Damaged hand chain or hand wheel.	Disassemble and inspect components as described in the "MAINTENANCE" and "INSPECTION" sections.
	Hand chain not installed properly (twisted).	Untwist hand chain. Refer to "MAINTENANCE" section for additional information.
Load Hook Latch does not work.	Latch broken.	Replace hook latch.
	Load hook bent or twisted.	Inspect load hook as described in "INSPECTION" section. Replace if necessary.

⚠WARNING

• Never perform maintenance on the hoist while it is supporting a load.
• Before performing maintenance, tag hoist:
DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.
• Only allow personnel trained in operating and servicing this product to perform maintenance.
• After performing maintenance on the hoist, test unit to 125% of its rated capacity before returning to service. Testing to 150% of rated capacity might be required to comply with standards and regulations set forth in areas outside of the USA.

Installing New Load Chain

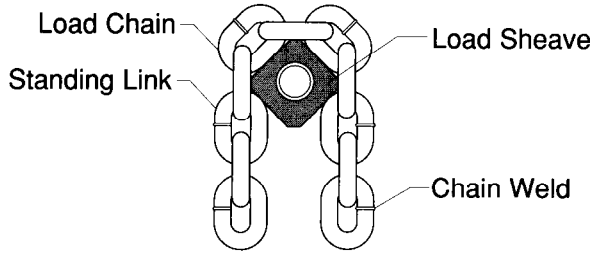
NOTICE

• Do not remove the old load chain from the hoist. The old load chain can be used to install the new load chain.

⚠WARNING

• To prevent a falling load which can cause death, injury or property damage the hook (4) must be on right fall of load chain (42) and left fall must be attached to hoist body with tail pin (40). Right and left are designated when viewed from the hand chain side of the hoist.

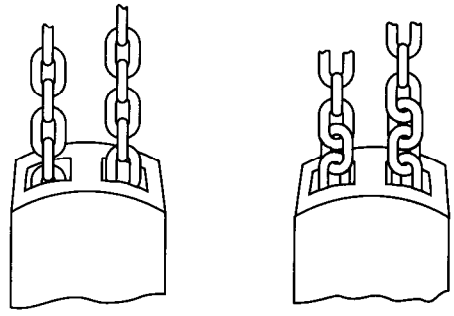
1. Ensure welds of "standing" links on the new chain are facing away from the load sheave (18). (ref. Dwg. MHTPA0042)
2. Ensure load chain (42) is reeved between load sheave (18) and chain guides (20 and 20A).
3. Hook (4) must be on right fall of load chain (42) and left fall must be attached to hoist body with tail pin (40). Right and left are designated when viewed from the hand chain side of the hoist.



(Dwg. MHTPA0042)

Attaching End of Load Chain

1. Remove socket bolt (41) and remove tail pin (40).
2. Make sure load chain (42) is not twisted, kinked or "capsized." (ref. Dwg. MHTPA0020)
3. Position end link of load chain (42) between body A (10) and body B (11) and slide tail pin (40) through end link. Secure by installing socket bolt (41).



(Dwg. MHTPA0020)

General Disassembly

The following instructions provide the necessary information to disassemble, inspect, repair, and assemble the hoist. Parts drawings of the hoist assembly are provided in the Parts Section.
If a hoist is being completely disassembled for any reason, follow the order of the topics as they are presented.
It is recommended that all maintenance work on the hoist be performed on a bench.
In the process of disassembling the hoist, observe the following:

1. Never disassemble the hoist any further than is necessary to accomplish the needed repair. A good part can be damaged during the course of disassembly.
2. Never use excessive force when removing parts. Tapping gently around the perimeter of a cover or housing with a soft hammer, for example, is sufficient to break the seal.
3. Do not heat a part with a flame to free it for removal. In general, the hoist is designed to permit easy disassembly and assembly. The use of heat or excessive force should not be required.
4. Keep the work area as clean as practical, to prevent dirt and other foreign matter from getting into bearings or other moving parts.
5. When grasping a part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.

6. Do not remove any part which is press fit in or on a sub-assembly unless the removal of that part is necessary for repairs or replacement.

Disassembly

Brake Disc Replacement

To remove brake discs (32), disassemble the hoist with the following procedure:

1. Unscrew Phillips head screws (38) and remove spring washers (39). Remove wheel cover (37).
2. Remove split pin (36) and pull out stopper pin (35). Remove wheel stopper (34).
3. Remove hand wheel (33) by holding load chain (42) and rotating hand wheel (33) counterclockwise. Remove one brake disc (32).
4. Remove ratchet gear (31), bushing (30) and second brake disc (32).

Accessing Load Gear (19)

1. Follow the steps 1 through 4 under "Disassembly for Brake Disc Replacement" to access socket bolts (22 and 22A).
2. Loosen socket bolts (22 and 22A) until U-nuts (23) come off. Remove socket bolts (22 and 22A).
3. Position hoist with body B (11) up.
4. While using cutouts in body B (11) to hold frame (13) against body A (10), carefully pry body B (11) apart from frame (13). Remove body B (11).
5. Inspect load gear (19). Repair or replace if necessary. Lubricate as needed.

Accessing Load Sheave (18)

1. Follow the steps 1 through 4 under "Disassembly for Brake Disc Replacement" and steps 1 through 5 under "Accessing Load Gear."
2. Unscrew friction disc (29) from pinion (14).
3. Remove socket bolts (22) and (22A) then lift body off body A (10).
4. Remove load chain stripper (21), load sheave (18) and chain guide (20).
5. Remove top pin (3) and top hook (1).
6. Remove load chain tail pin (40).
7. Remove frame (13). Separate load gear (19) from body B (11).

Cleaning, Inspection and Repair

Use the following procedures to clean and inspect the components of the hoist.

Cleaning

Clean all hoist component parts in an acid free solvent (except for the brake discs). The use of a stiff bristle brush will facilitate the removal of accumulated dirt and sediments on the gears and frames. Dry each part using low pressure, filtered compressed air.

Inspection

All disassembled parts should be inspected to determine their fitness for continued use. Pay particular attention to the following:

1. Inspect all gears for worn, cracked, or broken teeth.
2. Inspect shafts for ridges caused by wear. If ridges caused by wear are apparent on shafts, replace the shaft.
3. Inspect all threaded items and replace those having damaged threads.
4. Measure the thickness of the brake discs. If brake discs do not have uniform thickness or are less than 3/32 in. (2.4 mm) thick replace brake discs.

Repair

Actual repairs are limited to the removal of small burrs and other minor surface imperfections from gears and shafts. Use a fine stone or emery cloth for this work.

1. Worn or damaged parts must be replaced. Refer to the applicable parts listing for specific replacement parts information.
2. Inspect all remaining parts for evidence of damage. Replace or repair any part which is in questionable condition. The cost of the part is often minor in comparison with the cost of redoing the job.
3. Smooth out all nicks, burrs, or galled spots on shafts, bores, pins, and bushings.
4. Examine all gear teeth carefully, and remove nicks and burrs.
5. Polish the edges of all shaft shoulders to remove small nicks which may have been caused during handling.
6. Remove all nicks and burrs caused by lockwashers.

Assembly

Brake Discs

⚠ CAUTION

• The brake will not operate properly if there is oil on the brake discs (32). Excessive oil or grease on brake components could cause the load to slip.

1. Place one brake disc (32) on friction disc (29).
2. Install bushing (30) and ratchet gear (31). Pawl (27) and ratchet gear (31) must "click" when gear (31) is rotated clockwise and must also stop gear (31) from rotating counterclockwise.
3. Place the other brake disc (32) on ratchet gear (31).
4. Ensure hand chain (43) is properly seated in hand wheel (33). With brake surface towards brake disc (32), place hand wheel (33) on pinion (14). Rotate hand wheel (33) clockwise until clicking occurs. Hold load chain (42) to keep pinion (14) from rotating, if necessary.
5. Align pilot holes in wheel stopper (34) and pinion (14).
6. Insert stopper pin (35) through wheel stopper (34). Install split pin (36) and spread prongs apart.
7. Position wheel cover (37) and secure with spring washers (39) and screws (38).

Load Gear (19) Assembly

1. Lubricate and install load gear (19).
2. Making sure chain stripper (21) is seated in frame (13), position body B (11) on frame (13).
3. Place U-nuts (23) into indentions in body B (11). Insert and tighten socket bolts (22 and 22A).
4. Lay hoist on body B (11) and make sure friction disc (29) is seated. Rotate friction disc (29) clockwise if necessary.
5. Follow steps 1 through 7 under "Assembly of Brake Discs" to complete assembly of hoist.

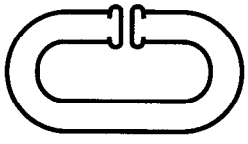
Load Sheave (18) Assembly

1. Apply a generous amount of grease to load gear (19) and install in body B (11).
2. Install frame (13).
3. Install load sheave (18) and load chain. Install load chain stripper (21) and chain guide (20).
4. Install load chain tail pin (40) and last link of load chain. Ensure load chain is not twisted.
5. Install top hook (1) with top pin (3).
6. Install pinion (14) so splined end enters first.
7. Install body A (10) and secure with socket bolts (22) and (22A).
8. Install friction disc (29) by screwing it onto pinion (14) until snug.
9. Follow steps 1 through 5 under "Load Gear Assembly" and 1 through 7 under "Assembly of Brake Discs" to complete assembly of hoist.

Hand Chain Adjustment or Replacement

⚠ CAUTION

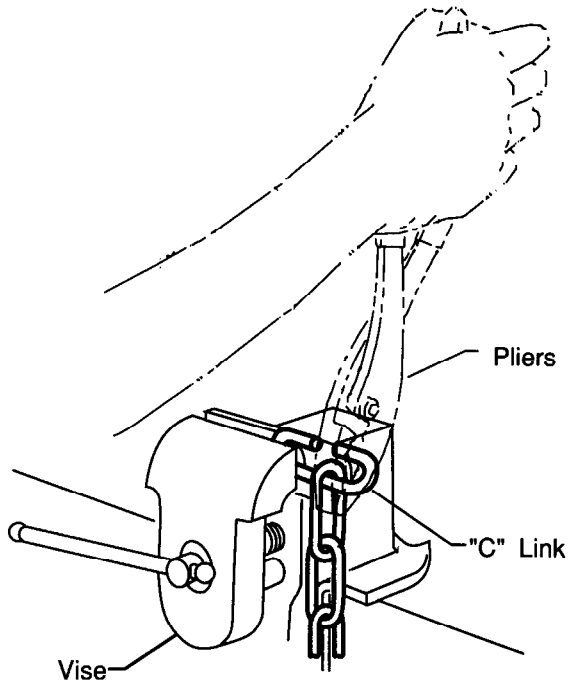
• When cutting the weld side of a hand chain link, do not cut or nick the opposite side. A damaged link must be replaced to prevent premature failure. A falling hand chain could cause injury.



"C" Link

(Dwg. MHTPA0016)

1. To create a "C" link, cut the welded side of the link with a hack saw. Clamp one side of the "C" link in a vise and bend it open by using a pliers to grip the exposed part of the link. Refer to Dwgs. MHTPA0014 and MHTPA0016.



(Dwg. MHTPA0014)

2. If you are replacing the hand chain, disconnect it at the "C" link and carefully remove the hand chain.
3. When replacing a hand chain, cut a length 2 times the required hand chain drop plus about one foot (305 mm). For adjustments, remove or add a length of chain twice the difference in hand chain height. To prevent the hand chain from twisting, maintain an even number of links, by removing or adding an even number of links.
4. If you are replacing the hand chain, run the new hand chain up through the left hand chain guide, around the handwheel, making sure the hand chain is seated in the handwheel pockets, and back down through the right hand chain guide.
5. Connect the hand chain ends with the "C" link(s), making the total number of links even, and bend the "C" link(s) shut.
6. Make sure the hand chain is not twisted. If twisted, untwist or open a "C" link and remove one hand chain link if necessary.

Load Test

Prior to initial use, all new, extensively repaired, or altered hoists shall be load tested by or under the direction of a person trained in the operation and maintenance of this hoist, and a written report furnished confirming the rating of the hoist. Test hoist to 125% of its rated capacity. Testing to 150% of the rated hoist capacity may be necessary to comply with standards and regulations set forth in areas outside of the USA.

DIFFERENCES BETWEEN THE ME4 AND ME HOISTS

As part of our continuing effort to provide the best available products, the ME underwent a minor redesign. Several internal parts were changed. The improved version of the ME was renamed the ME4. From the outside, the ME4 and ME look alike. To determine which model you have, look at the model label attached to the unit.

From the standpoint of maintaining the hoist, the most important change is the treatment of the brake discs. The ME brake discs must be soaked in oil. See the ME Operation and Maintenance manual for duration and oil type. The asbestos-free ME4 brake discs must be used dry.

Model: Usage:
ME Soak the brake discs in oil
ME4 Use the asbestos-free brake discs dry.

The parts that have been changed are listed below. None of the parts listed below are interchangeable between the ME4 and the ME. All other parts are interchangeable.

ITEM NO.	DESCRIPTION	CAPACITY (Metric Tons)	NON-INTERCHANGEABLE PARTS		COMMENTS:
			ME4 PART NO.	ME PART NO.	
12	Name Plate B	1/2	71043889	- - -	
		1	71043897	- - -	
		1-1/2	71043905	- - -	
		2	71043913	- - -	
		3	71043921	- - -	
		5	71043939	- - -	
14	Pinion	1/2	71036420	71244	
		1 & 2	71036404	71295	
		1-1/2 & 3	71036412	71267	
		5	71036438	72094	
29	Friction Disc	1/2	71941	71231	
		1, 1-1/2, 3 & 5	72053	71648	
30	Bushing (ME4)	1/2	71944	N/A	
		1, 1-1/2, 3 & 5	72056	N/A	
	Brake Disc B (ME)	1/2	N/A	71230	
		1, 1-1/2, 3 & 5	N/A	71649	
31	Ratchet Gear	1/2	71036446	71229	
		1, 1-1/2, 3 & 5	71036453	71650	
32	Brake Disc (ME4)	1/2	71942	N/A	ME4 is asbestos-free.
		1, 1-1/2, 3 & 5	72054	N/A	ME4 is dry.
	Brake Disc (ME)	1/2	N/A	71228	ME is wet.
		1, 1-1/2, 3 & 5	N/A	71651	
33	Hand Wheel	1/2	71036487	71227	
		1 & 2	71036495	71652	
		1-1/2, 3 & 5	71036503	71653	
80	Brake Disc Label	All	71043871	N/A	"Do not oil brake discs"

PARTS ORDERING INFORMATION

The use of replacement parts other than genuine **Ingersoll-Rand Material Handling** parts may invalidate the Company's warranty. For prompt service and genuine **Ingersoll-Rand Material Handling** parts provide your nearest Distributor with the following:

1. Complete model number as it appears on the name plate: ME4 plus capacity.
2. Part number and part name as shown in manual.
3. Quantity required.

The hoist nameplate is located on the gear cover. Example shown is for a 3 ton ME4 hoist. Nameplate is not shown actual size.

For your convenience and future reference it is recommended that the following information be recorded.

Hoist Model Number.....

Hoist Serial Number.....

Date Purchased.....

Return Goods Policy

Ingersoll-Rand will not accept any returned goods for warranty or service work unless prior arrangements have been made and written authorization has been provided from the location where the goods were purchased. Hoists returned with opened, bent or twisted hooks, or without chain and hooks, will not be repaired or replaced under warranty.

NOTICE

• Continuing improvement and advancement of design may cause changes to this hoist which are not included in this manual. Manuals are periodically revised to incorporate changes. Always check the manual edition number on the front cover for the latest issue.
• If your hoist has special finish requirements for painted parts, please specify when ordering.

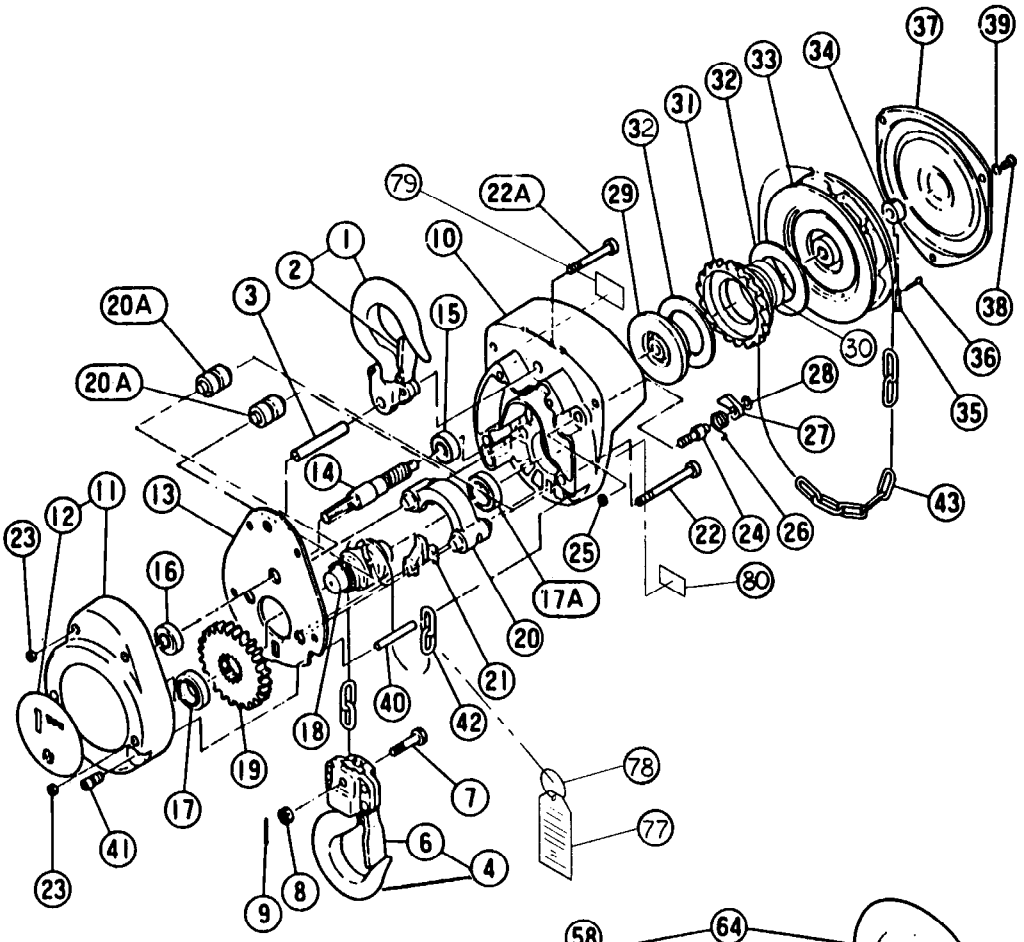
When the life of the hoist has expired, it is recommended that the hoist be disassembled, degreased and parts separated as to materials so that they may be recycled. For additional information contact:

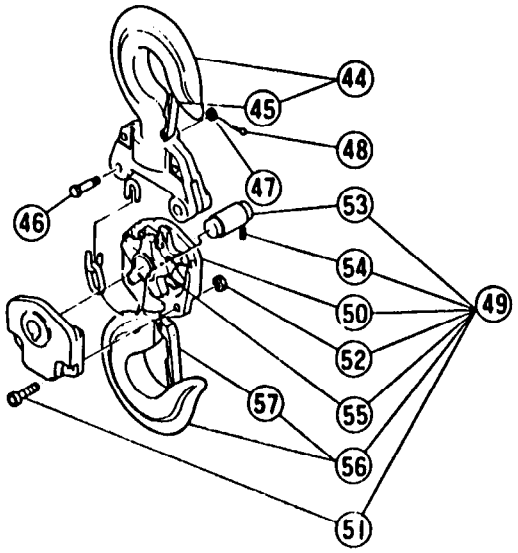
Ingersoll-Rand Material Handling
2724 Sixth Avenue South
Seattle, Wa 98124 USA
Phone: (206) 624-0466
Fax: (206) 624-6265
or
Ingersoll-Rand Material Handling
Samiia, Douai Operations
111, avenue Roger Salengro
59450 Sin Le Noble, France
Phone: (33) 27-93-08-08
Fax: (33) 27-93-08-00

ACCESSORIES

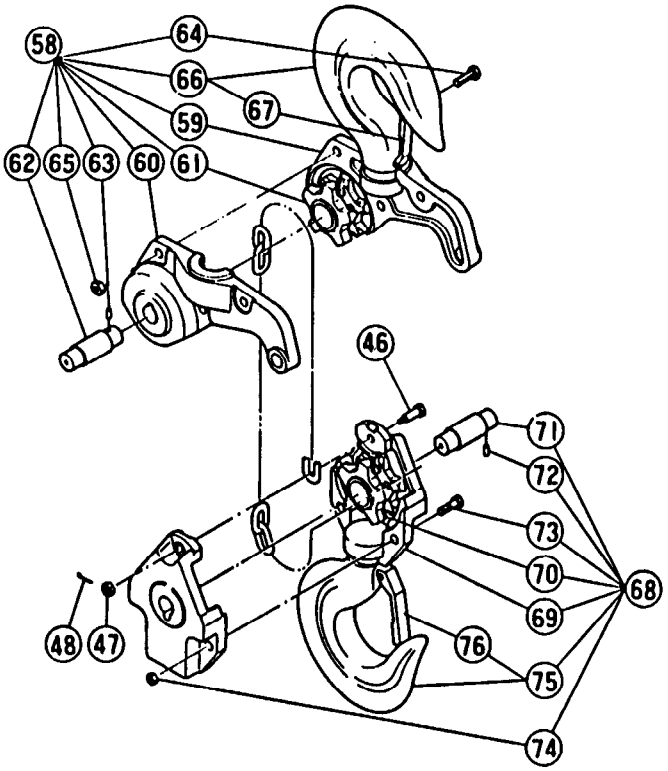
Description	Part No.
Orange Touch-Up Paint	MHD-OR
Chain Lubricant	LUBRI-LINK
Chain Lubricant (Food Grade)	LUBRI-LINK GREEN

ME4 HOIST ASSEMBLY DRAWING





2 and 3 ton Top and Bottom Hooks



5 ton Top and Bottom Hooks

(Dwg. MHTPB0069)

ME4 MANUAL CHAIN HOIST PARTS LIST

ITEM NO.	DESCRIPTION OF PART	QTY TOTAL	PART NO.					
			ME4-005 1/2 ton	ME4-010 1 ton	ME4-015 1-1/2 ton	ME4-020 2 ton	ME4-030 3 ton	ME4-050 5 ton
1	Top Hook Assembly	1	71255	71307	71627	- - -	- - -	- - -
2	Hook Latch T	1	71256	71306	71628	- - -	- - -	- - -
3	Top Pin	1	71254	71305	71629	71305	71629	
• 4	Bottom Hook Assembly	1	71253	71304	71630	- - -	- - -	- - -
• 6	Hook Latch B	1	71256	71306	71628	- - -	- - -	- - -
• 7	Chain Pin	1	72096	72097	72098	- - -	- - -	- - -
• 8	Slotted Nut	1	72099	72100	73101	- - -	- - -	- - -
• 9	Split Pin	1	72102	72103	72104	- - -	- - -	- - -
10	Body A	1	71248	71299	71636	71299	71636	
11	Body B	1	71247	71298	71637	71298	71637	
12	Name Plate B	1	71043889	71043897	71043905	71043913	71043921	71043939
13	Frame	1	71245	71296	71642	71296	71642	
14	Pinion	1	71036420	71036404	71036412	71036404	71036412	71036438
15	Bearing A	1	50388	50385				
16	Bearing B	1	50384		70262	50384	70262	71641
17	Bearing C	1	50387	50386	71638	50386	71638	
17A	Bearing D	1	71592	71639	71640	71639	71640	
18	Load Sheave	1	71243	71294	71268	71294	71268	72095
19	Load Gear	1	71242	71293	71643	71293	71643	- - -
20	Chain Guide	1	- - -	71292	71644	71292	71644	
20A	Guide Roller	2	71241	- - -	- - -	- - -	- - -	- - -
21	Stripper	1	71240	71291	71645	71291	71645	
22	Socket Bolt	2	71237	71290	71646	71290	71646	
22A	Socket Bolt	2	71238	71289	71647	71289	71647	
23	U-Nut	4	71239					
24	Pawl Pin	1	71236					
25	U-Nut	1	71239					
26	Pawl Spring	1	71234					
27	Pawl	1	71233					
28	Snap Ring	1	71232					
29	Friction Disc	1	71941	72053				
30	Bushing	1	71944	72056				
31	Ratchet Gear	1	71036446	71036453				
• 32	Brake Disc	2	71942	72054				
33	Hand Wheel	1	71036487	71036495	71036503	71036495	71036503	
34	Wheel Stopper 1	1	71226	71654				
35	Wheel Stopper Pin	1	71225					
36	Split Pin	1	71224					
37	Wheel Cover	1	71223	71655	71656	71655	71656	
38	Screw	3	71222					
39	Spring Washer	3	71221					
40	Tail Pin	1	71220	71657	71658	71657	71658	
41	Socket Bolt	1	71219	71659				
42	Load Chain	1	LCCF005	LCCF010	LCCF015	LCCF010	LCCFO15	

• Recommended spares.

ME4 MANUAL CHAIN HOIST PARTS LIST

ITEM NO.	DESCRIPTION OF PART	QTY TOTAL	PART NO.					
			ME4-005 1/2 ton	ME4-010 1 ton	ME4-015 1-1/2 ton	ME4-020 2 ton	ME4-030 3 ton	ME4-050 5 ton
43	Hand Chain	1	HCCF005					
44	Top Hook Assembly	1	---	---	---	71260	71277	---
45	Hook Latch T	1	---	---	---	71261	71278	---
46	Chain Pin	1	---	---	---	71269	71279	
47	Slotted Nut	1	---	---	---	71270	71280	
48	Split Pin	1	---	---	---	71271	71281	
• 49	**Bottom Hook Set**	1	---	---	---	71272	71282	---
50	Bottom Yoke	2	---	---	---	71665	71283	---
51	Socket Bolt	2	---	---	---	71246	71284	---
52	U-Nut	2	---	---	---	71297	71285	---
53	Shaft	1	---	---	---	71273	71286	---
54	Spring Pin	1	---	---	---	71274		---
55	Idle Sheave	1	---	---	---	71275	71287	---
56	Bottom Hook	1	---	---	---	71276	71288	---
• 57	**Hook Latch B**	1	---	---	---	71261	71278	---
58	Top Hook Set	1	---	---	---	---	---	71259
59	Top Yoke A	1	---	---	---	---	---	71660
60	Top Yoke B	1	---	---	---	---	---	71661
61	Idle Sheave	1	---	---	---	---	---	71263
62	Shaft	1	---	---	---	---	---	71264
63	Spring Pin	1	---	---	---	---	---	71662
64	Socket Bolt	3	---	---	---	---	---	71663
65	U-Nut	3	---	---	---	---	---	71664
66	Top Hook	1	---	---	---	---	---	71258
67	Hook Latch T	1	---	---	---	---	---	71265
• 68	**Bottom Hook Set**	1	---	---	---	---	---	71266
69	Bottom Yoke	2	---	---	---	---	---	71262
70	Idle Sheave	1	---	---	---	---	---	71263
71	Shaft	1	---	---	---	---	---	71264
72	Spring Pin	1	---	---	---	---	---	71274
73	Socket Bolt	2	---	---	---	---	---	71284
74	U-Nut	2	---	---	---	---	---	71285
75	Bottom Hook	1	---	---	---	---	---	71258
• 76	**Hook Latch B**	1	---	---	---	---	---	71265
77	Warning Tag	1	71038863					
78	Tag Ring	1	50040					
79	Chain Installation Label	1	T-6					
80	Brake Disc Label	1	71043871					
* 81	Parts, Operation and Maintenance Manual	1	Form No. MHD56018					

• Recommended spares

* Not illustrated

HOIST AND WINCH LIMITED WARRANTY

Ingersoll-Rand Company (I-R) warrants to the original user its Hoists and Winches (Products) to be free of defects in material and workmanship for a period of one year from the date of purchase. I-R will repair, without cost, any Product found to be defective, including parts and labor charges, or at its option, will replace such Products or refund the purchase price less a reasonable allowance for depreciation, in exchange for the Product. Repairs or replacements are warranted for the remainder of the original warranty period.

If any Product proves defective within its original one year warranty period, it should be returned to any Authorized Hoist and Winch Service Distributor, transportation prepaid with proof of purchase or warranty card.

This warranty does not apply to Products which I-R has determined to have been misused or abused, improperly maintained by the user, or where the malfunction or defect can be attributed to the use of non-genuine I-R parts.

I-R makes no other warranty, and all implied warranties including any warranty of merchantability or fitness for a particular purpose are limited to the duration of the expressed warranty period as set forth above. I-R's maximum liability is limited to the purchase price of the Product and in no event shall I-R be liable for any consequential, indirect, incidental, or special damages of any nature rising from the sale or use of the Product, whether based on contract, tort, or otherwise.

Note: Some states do not allow limitations on incidental or consequential damages or how long an implied warranty lasts so that the above limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

IMPORTANT NOTICE

It is our policy to promote safe delivery of all orders.
This shipment has been thoroughly checked, packed and inspected before leaving our plant and receipt for it in good condition has been received from the carrier. Any loss or damage which occurs to this shipment while enroute is not due to any action or conduct of the manufacturer.

VISIBLE LOSS OR DAMAGE
If any of the goods called for on the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt.

CONCEALED LOSS OR DAMAGE
When a shipment has been delivered to you in apparent good condition, but upon opening the crate or container, loss or damage has taken place while in transit, notify the carrier's agent immediately.

DAMAGE CLAIMS
You must file claims for damage with the carrier. It is the transportation company's responsibility to reimburse you for repair or replacement of goods damaged in shipment. Claims for loss or damage in shipment must not be deducted from the Ingersoll-Rand invoice, nor should payment of Ingersoll-Rand invoice be withheld awaiting adjustment of such claims as the carrier guarantees safe delivery.
You may return products damaged in shipment to us for repair, which services will be for your account and form your basis for claim against the carrier.

United States Office Locations

For Order Entry and Order Status

Ingersoll-Rand Distribution Center
P.O. Box 618
510 Hester Drive
White House, TN 37188
Phone: (615) 672-0321
Telex: 786573
Fax: (615) 672-0801

For Technical Support

Ingersoll-Rand Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
Phone: (206) 624-0466
Telex: 328795
Fax: (206) 624-6265

Regional Sales Offices

Atlanta, GA
111 Ingersoll-Rand Drive
Chamblee, GA 30341
Phone: (404) 936-6230

Detroit, MI
23192 Commerce Drive
Farmington Hills, MI 48335
Phone: (313) 476-6677
Fax: (313) 476-6670

Houston, TX
Suite 150
2500 East T.C. Jester
Houston, TX 77008
Phone: (713) 864-3700

Los Angeles, CA
5533 East Olympic Blvd.
Los Angeles, CA 90022
Phone: (213) 725-2826

Milwaukee, WI
12311 W. Silver Spring Dr.
Milwaukee, WI 53225
Phone: (414) 461-0973

Philadelphia, PA
P.O. Box 425
900 E. 8th Ave., Suite 103
King of Prussia, PA 19406
Phone: (215) 337-5930

Authorized Sales & Service

J. HERBERT CORPORATION
Call 1-800-255-0588
407-846-0588 Fax: 846-1066
info@jherbertcorp.com

Visit us online:
www.jherbertcorp.com

International

Offices and distributors in principal cities throughout the world. Contact the nearest **Ingersoll-Rand** office for the name and address of the distributor in your country or write/fax to:

Ingersoll-Rand Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
USA
Phone: (206) 624-0466
Telex: 328795
Fax: (206) 624-6265

Canada
National Sales Office
Regional Warehouse
Toronto, Ontario
51 Worcester Road
Rexdale, Ontario
M9W 4K2
Phone: (416) 675-5611
Fax: (416) 675-6920
Order Desk
Fax: (416) 674-6549

Regional Sales Offices

Calgary, Alberta
44 Harley Road S.E.
Calgary, Alberta
T2V 3K3
Phone: (403) 252-4180
Fax: (403) 252-4462

Edmonton, Alberta
1430 Weber Center
5555 Calgary Trail N.W.
Edmonton, Alberta
T6H 5G8
Phone: (403) 438-5039
Fax: (403) 437-3145

Montreal, Quebec
3501 St. Charles Blvd.
Kirkland, Quebec
H9H 4S3
Phone: (514) 695-9040
Fax: (514) 695-0963

British Columbia
201-6351 Westminster Hwy
Richmond, B. C.
V7C 5C7
Phone: (604) 278-0459
Fax: (604)278-2519

Latin America Operations
Ingersoll-Rand Production Equipment Group
730 N.W. 107 Avenue
Suite 300, Miami, FL
33172-3107
Phone: (305) 559-0500
Telex: 441617TLS UI
Fax: (305) 559-7505

Europe, Middle East and Africa
Ingersoll-Rand Material Handling
Samiia, Douai Operations
111, avenue Roger Salengro
59450 Sin Le Noble, France
Phone: (33) 27-93-08-08
Fax: (33) 27-93-08-00

Asia Pacific Operations
Ingersoll-Rand (Japan) Ltd.
Kawa Bldg. No. 17
2-7 Nishi-Azabu 1-Chrome
Minato-ku, Tokyo 106 Japan
Phone: (03) 3403-0641/7
Fax: 81 3 3401-2409

Russia
Ingersoll-Rand Company
World Trade Center
Office 1101
Krasnopresnenskaya Nab. 12
Moscow, Russia 123610

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